

WHAT IS CLAIMED IS:

1. A magnetic recording medium comprising:
a nonmagnetic substrate;
a perpendicular magnetic recording layer for
5 recording signal; and
a soft magnetic laminate layer formed between said
nonmagnetic substrate and said perpendicular magnetic
recording layer for recording signal, and including a
soft magnetic layer which has a thickness not larger
10 than 500 Å and a nonmagnetic layer.
2. The magnetic recording medium according to
claim 1, wherein the thickness of said nonmagnetic
layer is not larger than 1.5 times the thickness of
said soft magnetic layer.
- 15 3. The magnetic recording medium according to
claim 1, wherein the value of the saturation
magnetization per layer of said soft magnetic layer is
not larger than 90% of the saturation magnetization
value under a bulk state.
- 20 4. The magnetic recording medium according to
claim 1, wherein said soft magnetic layer contains as a
main component at least one element selected from the
group consisting of Fe, Co and Ni.
- 25 5. The magnetic recording medium according to
claim 1, wherein said nonmagnetic layer is formed of at
least one element selected from the group consisting of
B, C, Ti, Si, Al, Cr, Ru, Zr, Nb, and Ta.

6. The magnetic recording medium according to claim 1, wherein said soft magnetic layer is formed of an Fe-Al-Si alloy layer.

5 7. The magnetic recording medium according to claim 1, wherein said perpendicular magnetic recording layer is formed of at least one layer of a Co-Pt-Cr-O mainly containing magnetic thin film.

8. A magnetic recording medium comprising:
a nonmagnetic substrate;
10 a perpendicular magnetic recording layer;
a soft magnetic laminate layer formed between the nonmagnetic substrate and the perpendicular magnetic medium, and including a first soft magnetic layer, and a second soft magnetic layer laminated on said first
15 soft magnetic layer and differing from said first soft magnetic layer in the crystal structure.

9. The magnetic recording medium according to claim 8, wherein each of said first and second soft magnetic layers contains as a main component at least
20 one element selected from the group consisting of Fe, Co and Ni.

10. A magnetic recording medium comprising:
a nonmagnetic substrate;
a perpendicular magnetic recording layer;
25 a soft magnetic laminate layer formed between the nonmagnetic substrate and the perpendicular magnetic medium, and including a soft magnetic granular layer

formed of a nonmagnetic matrix and soft magnetic metal particles dispersed in said matrix ,and a soft magnetic layer.

11. A magnetic recording medium according to
5 claim 10, wherein said soft magnetic granular layer is formed on said perpendicular magnetic recording layer ,and said soft magnetic layer formed on said soft magnetic granular layer.

12. The magnetic recording medium according to
10 claim 10, wherein said the magnetic particles of soft magnetic layer contains as a main component at least one element selected from the group consisting of Fe, Co and Ni.

13. The magnetic recording medium according to
15 claim 10, wherein said nonmagnetic layer is formed of at least one element selected from the group consisting of B, C, Ti, Si, Al, Cr, Ru, Zr, Nb and Ta.

14. A magnetic recording apparatus, comprising:
a magnetic recording medium having a nonmagnetic
20 substrate, a perpendicular magnetic recording layer for recording signal, and a soft magnetic laminate layer formed between said nonmagnetic substrate and said perpendicular magnetic recording layer for recording signal, and including a soft magnetic layer which has a
25 thickness not larger than 500Å and a nonmagnetic layer;

driving means supporting and rotating the

perpendicular magnetic recording medium;

a magnetic head including an element for recording information in the perpendicular magnetic recording medium and another element for reading the recorded information; and

a carriage assembly supporting the magnetic head such that the magnetic head is movable relative to the magnetic recording medium.

15. A magnetic recording apparatus comprising:

a magnetic recording medium having a nonmagnetic substrate, a perpendicular magnetic recording layer, a soft magnetic laminate layer formed between the nonmagnetic substrate and the perpendicular magnetic medium, and including a first soft magnetic layer, and a second soft magnetic layer laminated on said first soft magnetic layer and differing from said first soft magnetic layer in the crystal structure;

driving means supporting and rotating the perpendicular magnetic recording medium;

a magnetic head including an element for recording information in the perpendicular magnetic recording medium and another element for reading the recorded information; and

a carriage assembly supporting the magnetic head and making the magnetic head be movable relative to the magnetic recording medium.

16. A magnetic recording apparatus comprising:

a magnetic recording medium having a nonmagnetic substrate, a perpendicular magnetic recording layer, a soft magnetic laminate layer formed between the nonmagnetic substrate and the perpendicular magnetic medium, and including a soft magnetic granular layer formed of a nonmagnetic matrix and soft magnetic metal particles dispersed in said matrix, and a soft magnetic layer;

driving means supporting and rotating the perpendicular magnetic recording medium;

a magnetic head including an element for recording information in the perpendicular magnetic recording medium and another element for reading the recorded information; and

a carriage assembly supporting the magnetic head and making the magnetic head be movable relative to the magnetic recording medium.